

WHAT IS CLAIMED IS:

1 1. In a wireless mesh network having a first node, at least
2 a second node and a network management station, the first and at
3 least second nodes and the network management station intercoupled
4 theretogether to permit communications therebetween, an improvement
5 of apparatus for dynamically selecting frequency levels at which to
6 define communication channels upon which to effectuate
7 communications during operation of the wireless mesh network, said
8 apparatus comprising:

9 a frequency level quality indicia measurer positioned at
10 each of the first and at least second nodes, said frequency level
11 quality-indicia measurer for measuring communication quality
12 indicia at a selected plurality of different global frequency
13 levels at the node at which each of said frequency level quality-
14 indicia measurers is positioned and for generating a report
15 representative of values of the communication quality indicia
16 measured thereat;

17 a global channel selection positioned at the network
18 management station and coupled to receive reports generated by each
19 of said frequency level quality-indicia measurers, said global
20 channel selector for selecting a first global frequency level at
21 which to define a first global communication channel upon which to
22 communicate first global communication signals with, and between,
23 all of the first and at least second nodes.

1 2. The apparatus of claim 1 wherein the communication
2 quality indicia measurer measures noise levels at each of the
3 selected plurality of different global frequency levels and wherein
4 the reports generated thereat contain listings of values of the
5 noise levels measured at the different global frequency levels.

1 3. The apparatus of claim 2 wherein selection by said
2 channel selector of the first frequency level at which to define
3 the first communication channel is made responsive to the listings
4 of the values of the noise levels measured at the different global
5 frequency levels at the first and at least second nodes.

1 4. The apparatus of claim 3 wherein the frequency level
2 selected by said global channel selector from amongst the plurality
3 of different global frequency levels to form the first frequency
4 level comprises the frequency level which exhibits minimal noise
5 levels according to a selected criteria.

1 5. The apparatus of claim 4 wherein the selected criteria
2 according to which said global channel selector determines the
3 first frequency level to exhibit the minimal noise levels comprises
4 lowest average noise levels.

1 6. The apparatus of claim 4 wherein the selected criteria
2 according to which said global channel selector determines the
3 first frequency level to exhibit the minimal noise levels comprises
4 lowest maximum noise level.

1 7. The apparatus of claim 1 wherein the first communication
2 channel defined at the first frequency level selected by said
3 channel selector comprises a control channel upon which to
4 communicate control signals with the first and at least second
5 nodes.

1 8. The apparatus of claim 1 wherein data communications are
2 selectably effectuable by the first and at least second nodes, and
3 wherein measurements made by said frequency level quality indicia
4 measurers are made during time periods absent of data communication
5 by the first and at least second nodes.

1 9. The apparatus of claim 8 wherein the wireless mesh
2 network is operable pursuant to a protocol scheme which defines
3 control slots forming time slots during which only control signals
4 are generated, and wherein the measurements made by said frequency
5 level quality indicia measurer at each of the first and at least
6 second nodes are made during the control slots.

1 10. The apparatus of claim 1 wherein said frequency level
2 quality indicia measurer further remeasures the communication
3 quality indicia at selected intervals.

1 11. The apparatus of claim 10 wherein said global channel
2 selector further selects the first frequency level at which to
3 define the first communication channel responsive to remeasurements
4 made by said frequency level quality indicia measurer.

1 12. The apparatus of claim 1 wherein measurements made by
2 said frequency level quality indicia measurer are made
3 automatically at selected intervals.

1 13. The apparatus of claim 1 wherein measurements made by
2 said frequency level quality indicia measurer are made responsive
3 to requests therefor.

1 14. The apparatus of claim 13 wherein the requests for
2 measurements, responsive to which said frequency level quality
3 indicia measurer makes measurements, are generated at the network
4 management station.

1 15. The apparatus of claim 1 wherein said frequency level
2 quality indicia measurer positioned at each of the first and at
3 least second nodes further selectably measure communication quality
4 indicia at a selected plurality of different local frequency
5 levels.

1 16. The apparatus of claim 15 further comprising a first
2 local channel selector positioned at the first node and coupled to
3 receive indications of measurements made by said frequency level
4 quality indicia measurer positioned at the first node of the
5 communication quality indicia at the selected plurality of
6 different local frequency levels, said first local channel selector
7 for selecting at least a first local frequency level at which to
8 define at least a first local communication channel upon which to
9 communicate first local communication signals within the first
10 node.

1 17. The apparatus of claim 16 wherein said frequency level
2 quality indicia measurer further generates a report representative
3 of values of communication quality indicia of the selected
4 plurality of different local frequency levels and wherein selection
5 made by said first local channel selector is made responsive to
6 values of the report representative of the values of the
7 communication quality indicia of the selected plurality of
8 different local frequency levels.

1 18. The apparatus of claim 15 further comprising a second
2 local channel selector positioned at the second node and coupled to
3 receive indications of measurements made by said frequency level
4 quality indicia measurer positioned at the first node of the
5 communication quality indicia at the selected plurality of
6 different local frequency levels, said second local channel
7 selector for selecting at least a second local frequency level at
8 which to define at least a second local communication channel upon
9 which to communicate second local communication signals within the
10 second node.

1 19. The apparatus of claim 15 wherein at least portions of
2 frequency ranges within which the different global frequency levels
3 are located and of frequency ranges within which the different
4 local frequency levels are located overlap.

1 ~~20.~~ In a method for communicating in a wireless mesh network
2 having a first node, at least a second node, and a network
3 management station, the first and at least the second nodes and the
4 network management station intercoupled theretogether to permit
5 communications therebetween, an improvement of a method for
6 dynamically selecting frequency levels at which to define
7 communication channels upon which to effectuate communication
8 during operation of the wireless mesh network, said method
9 comprising.

10 measuring communication quality indicia at a selected
11 plurality of different global frequency levels at each of the first
12 and at least second nodes;

13 generating reports representative of values of the
14 communication quality indicia measured during said operation of
15 measuring; and

16 selecting a global frequency level at which to define a
17 first global communication channel upon which to communicate first
18 global communication signals with, and between, all of the first
19 and at least second nodes.

1 21. The method of claim 20 further comprising the operation
2 of measuring at the first node communication quality indicia at a
3 selected plurality of different local frequency levels.

1 22. The method of claim 21 further comprising the operation
2 of selecting at least a first local frequency level at which to
3 define at least a first local communication channel upon which to
4 communicate first local communication signals within the first
5 node.